

**NORFOLK HARBOR AND CHANNELS
HAMPTON ROADS, VIRGINIA
CRANEY ISLAND EASTWARD EXPANSION
FEASIBILITY REPORT AND
ENVIRONMENTAL IMPACT STATEMENT SUMMARY**

STUDY INFORMATION

Study Authority. This study is authorized by resolution of the U.S. House of Representatives Committee on Transportation and Infrastructure dated 24 September 1997, which reads:

“Resolved by the Committee on Transportation and Infrastructure of the United States House of Representatives, That the Secretary of the Army is requested to review the report of the Chief of Engineers on the Norfolk Harbor and Channels (Deepening), contained in House Document 99-88, 99th Congress, 1st Session, and conduct a study of eastward expansion of the Federally owned CIDMMA. Such study shall be directly coordinated with the sponsor, the Commonwealth of Virginia, through the Secretary of Transportation represented by the VPA, and shall give specific attention to rapid filling to accommodate anticipated port expansion and to the operation of the existing facility while extending the useful life of CIDMMA, and shall take into account all relevant environmental issues and the subsequent transfer of the expanded area of CIDMMA to the Commonwealth of Virginia.”

Study Sponsor. The non-Federal sponsor, the Commonwealth of Virginia, acting through the Secretary of Transportation, represented by the Virginia Port Authority (VPA), participated extensively in all phases of the study process.

Study Purpose and Scope. The purpose of this Feasibility Report is to provide a final response to the study authority presented in the Congressional resolution. The study authority identifies three issues to be addressed in the Feasibility Study, which are:

- Eastward expansion of Craney Island Dredged Material Management Area (CIDMMA);
- Rapid filling to accommodate anticipated port expansion; and
- Extending the useful life of CIDMMA.

In addition, the Feasibility Study follows-up on preliminary findings resulting from the Section 905(b) Reconnaissance Phase of the analysis, which identified national defense needs as a potential project objective. The Feasibility Study also assesses the extent of potential Federal participation in implementation of the plan recommended in this Feasibility Report.

National Environmental Policy Act (NEPA). The Norfolk District and VPA prepared a Final Environmental Impact Statement (EIS) to present information on the recommended 580-acre eastward expansion of CIDMMA and development of a container terminal. A notice of availability of the Draft EIS was published in the *Federal Register* on 23 September 2005. The 45-day comment period for the Draft EIS ended on 7 November 2005. Seventy letters and over 200 comments were received. These comments were analyzed and considered in preparing the Final EIS, and responses to comments appear in the document. The Final EIS addresses the

direct, indirect, and cumulative impacts of the proposed development on human and environmental issues identified during the public interest review, including onsite and offsite alternatives. All factors that may be relevant to the proposed development were considered. Among those factors include air quality, dredged material management, surface transportation, economics, aesthetics and light, wetlands, cultural resources, fish and wildlife resources, land use and coastal zone management, endangered and threatened species, navigation, hydrodynamics, recreation, water quality, public safety, hazardous materials, social characteristics, environmental justice, noise, and, in general, the needs and welfare of the people. The anticipated impacts and mitigation measures (including avoidance, minimization, and compensation) related to the proposed actions were delineated by a NEPA Technical Committee and a Mitigation Subcommittee, working in collaboration with the U.S. Army Corps of Engineers (USACE) and VPA. A comprehensive mitigation plan is presented which offsets adverse impacts. The Final EIS provides relevant information to Federal, state, and local agencies and the public on the potential impacts of the proposed project and the recommended mitigation plan.

Project Location/Congressional District. Norfolk Harbor (sometimes referred to as the Port of Hampton Roads) is located in the southeastern part of the Commonwealth of Virginia at the southern end of Chesapeake Bay, midway on the Atlantic Seaboard. The harbor is formed by the confluence of the James, Nansemond, and Elizabeth Rivers. The land area surrounding the harbor encompasses about 1,500 square miles. The 2004 population of this area was about 1.6 million people. CIDMMA is centrally located within Norfolk Harbor and is bordered by the Elizabeth River to the east, the James River to the north and west, and the city of Portsmouth, Virginia, to the south. CIDMMA is located in the 3rd Congressional District, and Norfolk Harbor is located in the 3rd and 4th Congressional Districts.

Prior Reports and Existing Water Projects. A Section 905(b) analysis (Reconnaissance Phase Report) was conducted in 1999, which recommended Federal participation in a Feasibility-level analysis of the eastward expansion of CIDMMA. Prior to the 1997 Congressional resolution, numerous studies and reports were conducted concerning dredged material disposal at CIDMMA. The Engineer Research and Development Center (ERDC), formerly Waterways Experiment Station, published Technical Report EL-91-11, "Development of a Management Plan for CIDMMA," in December 1991, which identified operational and structural recommendations that have increased the useful life and dredged material capacity of CIDMMA.

Twenty-five significant navigation projects have been constructed within the Norfolk Harbor, ranging in depth from 6 feet to 50 feet when measured at mean low water (MLW). Construction and maintenance dredging materials from all of these projects are deposited at CIDMMA. The major deep-draft channels serving Norfolk Harbor are authorized to a depth of 55 feet below MLW. The 50-foot outbound element of the main channel was constructed in 1989 and the 50-foot anchorage was completed in October of 1999. The 50-foot inbound channel element is currently under construction, and completion is expected in 2006. Other deep-draft channels, anchorages, and turning basins in Norfolk Harbor are maintained at depths varying from 24 to 50 feet below MLW.

Federal Interest. The Reconnaissance Phase Report and Feasibility Report identified three areas of Federal interest in the eastward expansion, which include increased dredged material disposal capacity, waterborne transportation cost savings, and national defense. The recommended plan has a first cost of construction of \$671.3 million. The terminal, a 100% non-Federal cost, has a cost of \$1.2 billion. The recommended plan provides \$258.2 million in net benefits with a benefit cost ratio of 4.4. Environmental impacts associated with the recommended plan include the permanent loss of 580 acres of estuarine open water and river bottom habitat

and the associated loss of significant ecological resources. The recommended mitigation plan is fully justified and compensates for impacts to these resources.

STUDY OBJECTIVES

Problems and Opportunities. The major water resource problems at Norfolk Harbor include dredged material disposal capacity and container handling capacity, both of which cannot keep pace with demand. These problems confronting Norfolk Harbor result from the rapid growth in international maritime trade that the Nation has experienced over the past decade and which is expected to continue into the future. Planned navigation improvements and maintenance of existing channels will produce more dredged material than can be accommodated at CIDMMA. The demand for container handling capacity at Norfolk Harbor will exceed future capabilities by 2011, and the shortfall in container handling capacity will grow into the future. Projected shortages in dredged material disposal capacity and container handling capacity at Norfolk Harbor create the need for increased capacity for dredged material disposal and for expanded container handling facilities. The opportunity posed by existing and expected future conditions is to meet expected future dredged material disposal and container handling needs in a way that generates the greatest benefit to the Nation.

Existing Conditions for Dredged Material Storage Capacity: CIDMMA was originally authorized by Congress in 1946 and commenced operation in 1957. CIDMMA is authorized to accept all navigation related dredged material from the Norfolk Harbor area, including material from the USACE, the U.S. Navy, VPA, and private users within the harbor. Originally designed for a life span of 20 years, with a capacity of 96 millions cubic yards (mcy), the useful life and capacity of CIDMMA has been extended through innovative operations management (partitioning of drying areas) and structural modifications (strip drains and dike raising). CIDMMA currently holds over 225 mcy of dredged material deposits, receiving an average of 4.8 mcy of dredged material annually, although the total annual volume varies from year to year.

Existing Conditions for Container Handling Capacity: Norfolk Harbor is one of the busiest ports in the Nation, serving as the center of substantial industrial, commercial, and military activity. The port contains one of the largest concentrations of naval installations in the world. It is the eighth largest container port in the Nation and the third largest on the East Coast of the U.S. in terms of container cargo volume. Norfolk Harbor is a major international gateway to the Midwest. More than 55 percent of the containerized cargo handled at Norfolk Harbor originates in or is destined for locations outside Virginia.

Norfolk Harbor has experienced a 39 percent growth in containerized cargo volume between 2001 and 2004. Similar growth in containerized cargo volume has also been experienced at other major U.S. containership-ports on the East and West Coasts. Strong growth is expected to continue into the near future. In response to recent growth, and in anticipation of future growth, the VPA has developed a master plan (2040 Master Plan, VPA 2003) for structural and operational improvements that will increase the port's container handling capacity from approximately 1,881,000 TEU's in 2005 to 2,774,700 TEU's in 2040. The plan contains a budget and schedule for implementation of the improvements identified in the Master Plan.

Operational improvements that have been implemented or that are in the process of implementation include:

- Extended gate hours;
- Saturday gate hours during peak shipping season;
- Enhanced computer equipment for container tracking and yard planning;
- Use of double stacked trains; and

- A port-wide chassis pool that has improved trucker turn times and freed up acreage for storing containers (first U.S. port for implementation).

The structural improvements identified in the master plan, such as equipment and facility upgrades that have been recently implemented or that are in the process of implementation, include:

- Complete renovation of the Norfolk International Terminals (NIT) South wharf (4,230 linear feet) and the addition of 8 Suez-max Cranes;
- Renovation of 48 acres of container yard at NIT South; and
- Expansion of NIT North container yard (10 acres).

Planning Objectives. In general, the primary Federal objective is to contribute to National Economic Development (NED) and National Ecosystem Restoration. The pursuit and attainment of this objective must be consistent with national legal statutes, applicable executive orders, and other Federal planning requirements. The general and specific planning objectives for this study take an integrated systematic approach to the solution of dredged material placement and container handling capacity problems. Continuing vital dredging, maintaining appropriate depths, and preserving the port's economic health are all important considerations. The following specific objectives have been identified:

- Develop an environmentally and socially acceptable, technically feasible, and economical long-term disposal plan for dredged material management;
- Ensure that commercial and military navigation requirements will be satisfied;
- Provide for continued port growth and expansion that would enhance the economic well-being of the Norfolk Harbor and the Nation by providing the most efficient movement of waterborne cargo from origin to destination;
- In accordance with the limits of institutional participation, all plan components must meet NED objectives;
- Preserve and maintain the environmental character of the area under study, including such considerations as aesthetic, environmental, and social concerns, as directly related to plans formulated for implementation by the USACE; and
- Consider all practical beneficial uses of dredged material.

Planning Constraints. In addition to the typical general constraints that impact the planning process, this analysis was also impacted by a set of project specific constraints. A specific and important constraint concerning disposal of dredged material on a large scale in a highly developed area such as Norfolk Harbor is the acceptability of an alternative dredged material disposal facility to the general populace. The location of any alternative facility is a sensitive and controversial issue, which involves complex environmental, social, and political issues. Further specific constraints are listed below:

- Consideration must be given to eastward expansion of CIDMMA to accommodate anticipated port expansion, as per the Congressional study authorization; and
- Project benefits must be greater than project costs.

ALTERNATIVES

Plan Formulation Rationale. Although current law and policy preclude the USACE from cost-sharing in a port development project, the study authorization requires coordination between planning for port development and planning for dredged material placement. Specifically, plan formulation must be responsive to the authorizing Congressional resolution, which directs the USACE to "...give specific attention to rapid filling to

accommodate anticipated port expansion and to the operation of the existing facility while extending the useful life of CIDMMA...” The dual purpose of the authorizing resolution directs formulation to consider alternatives that address port expansion needs and also extend the useful life of CIDMMA. In summary, plan formulation has proceeded along with these two purposes:

- Assessment of net NED benefits of alternative plans that meet the dual purpose cited in the authorizing resolution (port development and CIDMMA useful life expansion); and
- Identification and evaluation of the least-cost disposal option, so that the Federal cost share, under existing laws and policies, can be identified.

Key Assumptions. The key assumptions of the analysis include the forecasted without project conditions as described below.

Without project Conditions for Dredged Material Storage Capacity: The without project disposal strategy for Norfolk Harbor, which is the disposal strategy that excludes any capital investments at CIDMMA (other than those already planned for), is the continued use of CIDMMA until the facility achieves its holding capacity in 2025. After 2025, with an interior dike height of 47 feet, the CIDMMA foundation will have reached its bearing capacity, and additional inflows will no longer be accommodated. In the years after 2025, Norfolk Harbor dredged material will be disposed at the USEPA designated ocean disposal site (the Norfolk Dredged Material Management Area), located approximately 47 miles from the CIDMMA and 17 miles east of the mouth of the Chesapeake Bay.

The estimated end of CIDMMA’s useful life (2025) is based on a forecast of future demand for dredged material storage at CIDMMA. In developing future deposition rate estimates for CIDMMA, the District queried Norfolk Harbor users that have historically placed large volumes of material into the CIDMMA, such as the USACE Norfolk District Operations Branch, U.S. Navy, and the VPA. In addition, known future users, such as APM/Maersk, that will require dredged material volume capacity in the future were also queried. The inflow schedules were reviewed to ensure the scheduled deposits would not exceed the capabilities of the facility. Individual year-by-year inflow projections were developed for 2005-2022. For years beyond 2022, this analysis assumes that the historic average of 4.8 mcy per year will continue to be a reasonable estimate of the future deposition rate into CIDMMA, inclusive of maintenance and identified new work dredging.

Without project Conditions Container Handling Capacity: The anticipated growth in containerized cargo volume outpaces planned improvements in Norfolk Harbor’s container handling capacity, which is constrained by existing real estate. By 2011, the containerized cargo volume forecasted for Norfolk Harbor will exceed its planned container handling capacity. By the end of the study period (2060), Norfolk Harbor is expected to increase its container handling capacity to more than 3 million TEU’s per year. However, the forecasted volume of TEU’s that would transit Norfolk Harbor under current and expected trade routes and vessel deployment patterns will be more than 13 million TEU’s per year (see the following table). Similarly, other major U.S. East Coast containership-ports will experience container handling capacity constraints during the 50-year planning horizon.

NORFOLK HARBOR CONTAINER HANDLING CAPACITY SHORTFALL (2010 – 2060)

	2010	2020	2030	2040	2050	2060
Forecasted Demand	2,430,603	3,586,882	5,142,876	7,260,737	10,060,200	13,819,187
Norfolk Harbor Capacity	2,487,000	2,560,260	2,657,500	2,774,720	2,916,024	3,086,363
Shortfall	0	1,026,622	2,485,376	4,486,017	7,144,175	10,732,824

In the without project condition after 2011, overflow cargo that would use Norfolk Harbor if container handling capacity were available, will have to switch to alternative ports that have available container handling capacity. A basic assumption of the without project condition is that Norfolk's excess TEU's, identified in the table above, will be serviced by alternative ports in order to maintain the forecasted trade between commodity origins and destinations. An analysis of TEU forecasts and planned improvements at other major U.S. container ports indicates that a number of other ports will also experience insufficient container handling capacity at some time during the study period.

During the course of this analysis, 18 potential alternative ports on the Pacific, Gulf, and Atlantic coasts were initially assessed as potential alternatives to Norfolk Harbor. This list of potential alternative ports was reduced through a screening process that assessed the likelihood that each port might be used as an alternative to Norfolk Harbor. Criteria used to identify the most likely alternative ports include future available container handling capacity, existing and planned channel depths, and frequency of calls by the major liner services calling at Norfolk Harbor.

Management Measures and Alternative Plans for Port Development. The VPA has conducted numerous studies to identify operational and structural measures that would increase container handling capacity at Norfolk Harbor. VPA has implemented many of these measures and plans to implement others as identified in the Port Master Plan dated 2004. In addition, the VPA has conducted a needs analysis based on the Master Plan forecast and planned operational capacity increases of the existing terminals. VPA found that 1,200 additional acres would be required to meet the containerized cargo forecast through 2040. The new APM facility, currently under construction, will provide approximately 300 acres of marine terminal. Therefore, the VPA still requires 900 acres of additional container terminal to meet the long-term forecast. Based on the findings of the needs analysis, the VPA conducted an extensive investigation of alternative port expansion opportunities within Norfolk Harbor and found that no area other than CIDMMA could support development of a major container handling facility.

Constraints at the CIDMMA site, such as the Federal channel to the east, the Rehandling Basin to the south, and the legal constraint on expansion to the west, restrict the largest possible port development project at CIDMMA to an expansion of approximately 580 acres to the east. Although a 580-acre port development project falls short of the identified need, it is the best solution available to VPA. In consideration of the many constraints to port development in Norfolk Harbor, VPA has identified a 580-acre container terminal on top of the eastward expansion of CIDMMA as the project that would best address future conditions.

Management Measures and Alternative Plans for CIDMMA Useful Life Extension Supporting Port Development. A multi-disciplinary alternatives analysis team was convened, and its work was independently reviewed to ensure that the full range of dredged material placement alternatives was identified and that each alternative was evaluated thoroughly and properly. The alternative plans were formulated under the following general assumptions:

- Expansion cells would be incorporated into the existing Dredged Material Management Plan (DMMP) unless otherwise noted. The expansion cells would be added into the cell rotation plan to continue optimal drying of material within the facility; and
- Port/confined disposal facility expansion cells will be rapidly filled, such that dredged material would be placed into that cell as rapidly as possible without the expansion cell participating in the DMMP cell rotation for optimal drying.

An alternatives matrix was created to facilitate the preliminary screening process, which utilized three preliminary screening criteria:

- Does the alternative provide long-term dredged material storage capacity for Norfolk Harbor (generally the geographic area currently included within the bounds authorized for the existing CIDMMA facility)?
- Does the alternative provide potential for container-port construction? and
- Does the alternative provide potential for military use of the site, either as logistical support, such as through a port facility, or as a potential training facility? Military use of the facility was cited as a potential source of Federal interest in the Section 905(b) Reconnaissance Report.

Out of the scores of plans that were included in the preliminary screening process, four plans emerged as candidates for further investigation. Under each of the four alternative plans, a 580-acre area suitable for port development would be constructed at the CIDMMA facility.

The four alternative plans that survived the initial screening process were advanced to the more rigorous intermediate screening evaluation. During intermediate screening, the alternative plans were assessed based on economic, engineering, and environmental criteria. Additional analyses conducted as a part of the intermediate screening evaluation include a navigation safety analysis; hydrodynamic modeling to predict with project current velocity, salinity, water level, etc.; and inflow modeling to predict ultimate dredged material storage capacity volume and lifetime for each of the four alternatives.

Final Array of Alternatives. As a result of the detailed analysis, two alternatives were advanced to a more detailed analysis of costs and benefits. These two alternatives are:

- Eastward expansion using the material spreading method, and
- Eastward expansion using the material spreading method (one-third is rapidly filled, the use of the remaining two-thirds is spread out over years in conjunction with the existing facility) with additional strengthening of the west dike in 2028.

Comparison of Alternatives: Transportation Cost Savings. Under the without project condition, TEU's that would otherwise be serviced at Norfolk Harbor would use alternative ports because of capacity constraints at Norfolk. Under with project conditions the associated increase in Norfolk Harbor's container handling capacity is more than 1.5 million TEU's per year. These TEU's would not need to be routed through alternative ports, because transportation costs are lower through Norfolk than they are through the alternative ports.

The additional container handling capacity provided by the CIDMMA terminal reduces, but does not eliminate, the volume of TEU's that would be handled under without project condition at alternative ports in future years. As referenced in previous discussions, the VPA estimated that it would need 900 acres to fully meet the demand for container capacity in 2040; however, only 580 acres can be realized from this project.

Transportation cost savings begin in 2016, the first year of container handling operations at the CIDMMA terminal. The base year of the analysis is 2010, which is the first year of dredged material placement for the project and, therefore, the first year of beneficial impact. There are no transportation cost savings associated with the project between 2010 and 2015. The transportation cost savings identified in the following table are identical for both eastward expansion alternative plans, i.e., with and without the western dike strengthening.

TOTAL TRANSPORTATION COST SAVINGS (2010-2060) (1)

	Sum of present values	AAEQ
Without project	\$13,404,492,000	\$748,481,000
With project	\$7,473,333,000	\$417,297,000
Transportation cost savings	\$5,931,158,000	\$331,184,000

(1) Discounted to base year 2010 at 5.125 percent.

AAEQ = Average Annual Equivalent Cost.

Comparison of Alternatives: Dredged Material Disposal Cost Savings. In addition to transportation cost savings, the two eastward expansion alternative plans also provide dredged material disposal benefits. The dredged material disposal benefits are based on the difference in dredged material disposal costs between disposal at CIDMMA and disposal at the U.S. Environmental Protection Agency (USEPA)-designated Norfolk dredged material ocean disposal site. Without strengthening the western dikes, the eastward expansion of CIDMMA provides 3 years of additional capacity and relatively fewer dredged material disposal benefits than eastward expansion with western dike strengthening, which provides 17 years of additional capacity.

AAEQ ALTERNATIVE PLAN DREDGED MATERIAL DISPOSAL BENEFITS (2010-2060) (1)

Item	Additional years of operation	AAEQ dredged material disposal benefits
Eastward expansion	3	\$2,286,000
Eastward expansion with west dike strengthening	17	\$8,546,000

(1) Discounted to base year 2010 at 5.125 percent.

The following table identifies the eastward expansion with strengthening of the western dikes in 2028 as the plan with the greatest net benefits that satisfies all the planning objectives and constraints that guided the planning process. The non-Federal partner, the VPA, has exercised an active role throughout the plan formulation process and has collaborated in the detailed evaluation of the two alternative plans. The VPA, however, prefers the eastward expansion as a stand alone project (the Locally Preferred Plan [LPP]), which excludes strengthening the western dikes. This preference is based on the uncertainty associated with making a decision today to strengthen the western dikes in 2028.

AVERAGE ANNUAL EQUIVALENT PROJECT COSTS AND BENEFITS COMPARISON (1)

Alternative	Costs	Benefits	Net benefits	Benefit-to-cost ratio
Eastward expansion	\$75,389,000	\$333,566,000	\$258,179,000	4.4
Eastward expansion with western dike strengthening	\$78,766,000	\$339,828,000	\$261,062,000	4.3

(1) All costs and benefits evaluated in October 2004 price levels, AAEQ calculations conducted over 50 years at 5.125 percent.

Recommended Plan. The main differences between the eastward expansion with west dike strengthening and the LPP are the differences in project cost and in the forecasted useful life of the CIDMMA. The first costs of construction for the eastward expansion with west dike strengthening and the LPP are the same; however, long-term costs would be less for the LPP without the expense of the western dike strengthening in 2028. In contrast, the LPP provides for less storage of dredged material than does the eastward expansion with west dike strengthening. The eastward expansion with west dike strengthening provides storage until 2042 or 67 mcyr more than the LPP. Both plans provide the same transportation cost savings.

The LPP provides more than 99 percent of the net benefits of the eastward expansion with west dike strengthening. In comparing these two plans, it is important to note that the LPP does not preclude strengthening the west dikes in the future when additional dredged material capacity would be required. The LPP provides dredged material disposal capacity up to 2028, at which time west dike strengthening could be reevaluated. As a component of the benefit maximizing plan, western dike strengthening would also likely require reevaluation under a General Reevaluation Report prior to construction in 2028. Based on these considerations, the LPP is advanced as the Recommended Plan.

Systems/Watershed Context. The recommended plan has been integrated into other watershed purposes including habitat enhancement and restoration, as well as commercial use. The recommended plan has the least hydrodynamic and least environmental impacts of all evaluated expansion alternatives. Technical review by National Marine Fisheries Service, U.S. Fish & Wildlife Service (USFWS), and USEPA was conducted for the Feasibility Study and the EIS.

Environmental Operating Principles. The recommended plan supports USACE Environmental Operating Principles by mitigating cumulative impacts using a systems (or watershed) approach. The mitigation plan provides ecosystem mitigation holistically across the landscape (sediments, wetlands, and oysters) and was developed collaboratively with multiple stakeholders. The plan recognizes interdependence of life and physical environment and is a proactive proposal to compensate for environmental consequences related to loss of 580 acres of estuarine open water in the Elizabeth River.

Independent Technical Review. Independent Technical Review (ITR) was continuous and ongoing throughout the entire study. Noteworthy in the ITR process is the fact that the District employed external entities to support ITR prior to the issuance of the new EC 1105-2-408 on Peer Review, adopted on 31 May 2006 requiring ITR to be managed by the Centers of Expertise. ITR was managed by the Norfolk District and

fully documented by the Quality Control Report dated January 2006. ITR consisted of both internal technical review by a District review team and external technical review. External entities employed included New York District and NAD for economic studies, ERDC and Moffat and Nichol Consultants for port design/safety issues at Craney Island, ERDC, Old Dominion University, Elizabeth River Project for Hydrodynamic Modeling to determine potential impacts of alternative expansions of Craney Island on estuarine circulation, and a broad-based NEPA compliance team including USEPA, National Oceanic and Atmospheric Administration, USFWS, Virginia Department of Environmental Quality, Virginia Marine Resources Commission, and Virginia Department of Conservation and Recreation, academia (Virginia Institute of Marine Science, Old Dominion University, College of William & Mary, University of North Carolina), the non-Federal sponsor (VPA), and qualified interested parties (Elizabeth River Project [ERP], Wetlands Watch, and James River Association) for EIS scoping/preparation including development of a \$50 million mitigation plan. Numerous technical review meetings were conducted and documented with appropriate follow-up actions. Technical review comments and responses are also documented in the Quality Control Report. In addition, the ITR process included involvement of the vertical team including both North Atlantic Division and Headquarters, USACE. This was particularly important in resolving policy issues related to the Federal interest in port development and development of an extensive mitigation plan for the loss of 580 acres of estuarine bottom. The Quality Control Report includes formal certification for both technical and legal review.

EXPECTED PROJECT PERFORMANCE

Project Costs. The project costs for the two alternatives include all project related costs such as costs related to construction, Preconstruction Engineering and Design, utility relocations, interest during construction (IDC), real estate, additional CIDMMA operations and maintenance (O&M), and mitigation. Economic costs (i.e., those include in NED calculations) also include the associated costs related to port infrastructure that are required to ensure the realization of projected transportation cost savings. These associated costs (borne entirely by the non-Federal sponsor) include costs related to port facility construction, landside access (road and rail), access channel deepening, port equipment, and related mitigation.

PROJECT FIRST COSTS CRANEY ISLAND EASTWARD EXPANSION

Construction Item	Cost
Design	\$27,824,000
Construction management	\$23,187,000
Construction	\$423,732,000
Navy Pipeline relocation	\$40,000,000
Environmental mitigation	\$50,200,000
Contingencies	\$106,398,000
Total project construction costs	\$671,340,000

Equivalent Annual Costs and Benefits.

EQUIVALENT ANNUAL COSTS AND BENEFITS CRANEY ISLAND EASTWARD EXPANSION

Investment Costs:	
Total project construction costs	\$671,340,000
IDC	<u>\$51,436,000</u>
Total investment cost	\$722,776,000
Average Annual Costs:	
Interest and amortization(2)	\$75,115,000
OMRR&R	<u>\$274,000</u>
Total average annual cost	\$75,389,000
Average annual benefits	\$333,566,000
Net annual benefits	\$258,177,000
Benefit-cost ratio	4.4 to 1
Benefit-cost ratio (at 7%) (1)	3.6 to 1

(1) Per Executive Order 12893.

OMRR&R = Operation, Maintenance, Repair, Rehabilitation, and Replacement.

(2) Includes Interest and Amortization of the non-Federal terminal costs of \$1.2 billion.

Cost-Sharing. The USACE Civil Works program provides for Federal interest in GNF's associated with navigation improvements. Excluded are interests in the development of port lands, facilities, and infrastructure. Transportation cost savings resulting from port expansion are legitimate NED benefits; however, they cannot be used as a basis for full Civil Works cost sharing of the CIDMMA eastward expansion based on current policy and law because the eastward expansion is not considered a General Navigation Feature (GNF). Under existing law and policy, the USACE cost-sharing responsibility for the recommended Eastward Expansion Plan is limited to the present value of the least-cost long-term dredged material placement method, identified as a west dike strengthening without any lateral expansion. The present value of the least-cost long-term dredged material method has been calculated as \$67,435,000.

In accordance with the CIDMMA's original Congressional authorization, Federal cost-sharing in the Recommended Plan will be recovered through the application of tolls. Because the Recommended Plan provides less additional dredged material disposal capacity than the least-cost disposal method, it is necessary to evaluate the discounted present value of the least-cost disposal method on a cost per unit basis. This will allow the proper distribution of the tolls. The least-cost disposal method would create a capacity of 67.2 mcy, providing of unit cost of \$1.003 per cubic yard (\$67,435,000/67.2 mcy). The Recommended Plan creates a capacity of 12 mcy. This provides for a Federal cost-sharing interest of \$12,042,000 (\$1.003x12 mcy) in the Recommended Plan on the basis of least cost disposal.

Cost-sharing for the access channels will be applied in accordance with Section 101 of the Water Resources Development Act of 1986, as amended, and cost shared as a GNF. This requires a blended cost-sharing structure as there are three cost-sharing depth increments involved. From 0 feet to 20 feet is cost shared 10 percent non-Federal and 90 percent Federal. From 21 feet to 45 feet is cost shared 25 percent non-Federal and 75 percent Federal. Any depth greater than 45 feet is cost shared 50 percent non-Federal and 50 percent Federal. In addition, 10 percent of the total construction cost will be paid by the non-Federal sponsor over a period of 30 years.

CONSTRUCTION COST SHARE APPORTIONMENT (2006 DOLLARS)

	Federal	Non-Federal	Total
Eastward Expansion	\$12,042,000	\$633,846,000	\$645,888,000
Access Channel	\$13,810,000	\$11,642,000	\$25,452,000
Total	\$25,852,000	\$645,488,000	\$671,340,000
Percentages	3.85%	96.15%	100%

Project Implementation. The non-Federal sponsor, the Commonwealth of Virginia, is committed to providing the project cost share, dredged material placement, and the container handling capacity needed to realize project benefits. The non-Federal sponsor has indicated its support for the proposed project most recently in a letter of intent dated 25 August 2005 in which the Commonwealth of Virginia endorsed moving forward with design and construction of the Recommended Plan.

Operation, Maintenance, Repair, Rehabilitation, and Replacement (OMRR&R). The USACE Civil Works program provides for Federal interest in GNF's associated with navigation improvements. Excluded are interests in the development of port lands, facilities, and infrastructure. The initial construction and O&M of the berthing and ship service facilities are also a non-Federal responsibility. Accordingly, the incremental costs of port development including terminal facility construction and O&M would be the responsibility of the non-Federal sponsor.

Key Social and Environmental Factors. There are no unresolved NEPA issues. Cumulative impacts from the potential expansion action and other nearby past, present, and reasonably foreseeable future actions have been identified and evaluated as part of the NEPA evaluation. An 11-step methodology promulgated in 1997 by the Council on Environmental Quality was utilized as the framework for the cumulative effects assessment study. A compensatory mitigation plan was developed with input from a Mitigation Subcommittee consisting of representatives from 12 Federal and state agencies and 3 local interest groups. The committee convened on 15 occasions between June 2002 and May 2005. A cost-effectiveness/incremental cost analysis was conducted resulting in a total of 22 plans that were determined to be cost-effective, including three "Best Buy" plans. The selected mitigation plan is one of the "Best Buy" plans. The costs of the mitigation plan are included in total project costs.

Stakeholder Perspectives and Differences. During the Feasibility Study, 29 Federal, state, and local agencies were contacted. In addition, 22 local interest groups and maritime industry representatives were contacted. Seven stakeholder meetings were held and 27 committee and agency meetings or workshops were held. There are no unresolved issues in response to comments to the Draft EIS. The final report and proposed Chief of Engineers report were circulated to the Commonwealth of Virginia and Federal agencies for comment on 18 May 2006 and published in the Federal Register with the 30-day review period ending on 03 July 2006. Responses to State & Agency comments were prepared on 30 June 2006 and forwarded to the agencies, as appropriate (see Appendix L of the FEIS).